INNERVATION OF RESPIRATORY MOVEMENTS.

In an exhaustive paper with extensive literary reference, DR. MAX MARCKWALD (Kreuznach) gives a number of original experiments, in which the movements of the diaphragm are graphically recorded by the direct application of the flattened end of a lever to the under surface of the muscle, through a small opening in the abdominal wall. Among the conclusions to be arrived at, may be mentioned the following:

No respiratory centres can be said to exist above the medulla oblongata, where an easily excited *inspiration-centre*, acting in normal breathing, and a more difficultly excited *expiration-centre*, acting in dyspnœa, are situated.

Automatically the centre can only give rise to respiratory spasms, regular and rhythmical breathing being reflex acts, excited by the tonic action of the vagi in quiet respiration.

Impulses from the higher centres can also reflexly excite regular respiratory movements controlling or compensating those produced by the vagus. When these impulses from the higher centres are partially in abeyance, while the action of the vagus is unimpaired, periodic breathing (Cheyne-Stokes) may appear. Impulses from the skin have probably little effect while the vagal and cerebral channels are intact; but when these are interfered with, the sensory nerves may excite a regular series of respiratory movements.

The afferent fibres of the fifth, superior laryngeal, olfactory and splanchnic nerves slow respiration, and may cause standstill in the position of expiration. The glossopharyngeal do not alter the rate, but can produce slow inhibition.

The normal excitation of the respiratory centre does not depend upon the stimulation of the blood—either its want of oxygen, or excess of carbonic acid—as regular movements continue for some time without circulation; nor can the mechanical theory—the excitation depending on the degree of distention of the lungs—be accepted, as rhythmical movements continue when the thorax is opened and the lungs excised.—*Zeitschrift f. Biologie*, N. F. Bd. v.

MATERIA MEDICA, THERAPEUTICS, AND PHARMACOLOGY.

UNDER THE CHARGE OF

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LOBELINE.

From advance sheets of the *Drugs and Medicines of North America*, for which we are indebted to Prof. Lloyd, we obtain the investigations of DR. BARTHOLOW on the actions and uses of lobeline—the alkaloid of *Lobelia inflata*. Several papers have appeared on the physiological actions of lobeline, but up to the present there have been published no reports on its clinical uses. Lobelia, the crude drug, has been the subject of no little controversy, and much has been said of its practical applications, but wholly from the empirical standpoint.

Lobeline is a liquid alkaloid of a brownish-red color, and it has an acrid taste and a tobacco-like odor. The salts are crystalline, and are freely soluble. The preparation used by Dr. Bartholow in his physiological and clinical research was a solution of the hydrobromate, furnished him by Prof. Lloyd.

In general terms, lobeline is a paralyzer, causing death by failure of respiration. Small doses at first increase the irritability of the reflex centres, and the cutaneous and corneal reflex are considerably exaggerated. As the action proceeds the paralysis beginning at the periphery increases, until finally complete muscular resolution occurs. The end organs of the motor nerves are first affected, then the nerve trunk, and finally the cord; but the muscles preserve their contractility. The pneumogastric terminals are paralyzed, and the heart, after a brief slowing, increases in movement considerably. If the medulla be first divided, when the full effects of lobeline are obtained the heart is arrested in the diastole, its cavities distended. If now a faradic current is applied, the auricle will start in action, but only the basal portion of the heart, and the latter acts much more feebly than the former. As the effects of lobeline develop, and before full paralysis occurs, the vasomotor centre is stimulated somewhat, and the blood-pressure rises a little; but it subsequently declines. Lobeline does not paralyze the heart muscle, and death is due to respiratory failure.

As respects sensibility, there is no action, for the sense of pain is manifested until full paralysis occurs. Locally it has a benumbing effect on the mucous membrane, but this is due to physical conditions, and is not a special endowment of lobeline. Consciousness is preserved until carbonic acid narcosis ensues.

Lobeline appears to be too harsh and depressing to be utilized as an emetic. In the ordinary medicinal doses it does not usually nauseate. One subject, an epileptic, complained of nausea after several days use, but it seemed to be transient. Based on the physiological actions it was tried in various neuroses. As it is not depressing to the heart, it was used in some cases of cardiac asthma, when with difficult breathing there was a rather feeble state of the cardiac action. In this condition, and in pseudo-angina pectoris, it was found to be very useful. Asthma—the neurosis—has been the malady above all others in which lobelia has proved useful. The alkaloid seems to be superior to the crude drug.

It has also proved useful in coughs, especially when they are of a spasmodic character; and as they are necessarily reflex, an agent that lessens the activity of the reflex centres must do good to some extent. Lobeline appears to be an effective remedy as an expectorant so-called.

It has also been used with benefit in epilepsy, chorea, and the spasmodic neuroses generally; but a longer experience is necessary to determine its real value. It can be said only that thus far it promises well.

The dose of the salts of lobeline will vary from $\frac{1}{100}$ gr. to $\frac{1}{20}$ gr. It does not appear to be as actively toxic as nicotine.

CARBONIC ACID INHALATION AND RECTAL INJECTION.

One of the most remarkable revivals in a therapeutical method that has happened lately, is the administration of carbonic acid gas by inhalation and by rectal injection. The proposers and advocates of this practice apparently suppose it to be a new discovery, or, at least, a novel expedient. So far from being new, it is distinctly a revival of an old suggestion—for Priestly, in his treatise entitled *Experiences of Different Kinds of Air*, alludes to the use of carbonic acid gas by inhalation in phthisis, and Percival (1768), on the *Use of Fixed Air*, proposed its administration by rectal injection. In a recent paper (*Bull. Gén. de Thérap.*, January 15, 1887) DR. M. DUPONT advocates the method of inhalation as more efficient than the rectal injection. If sulphydrogen gas is to be administered, rectal injection may be necessary, for, as Bernard demonstrated, this gas, when thrown into the rectum, escapes by the lungs, and does not act on the nervous centres; but carbonic acid gas which is mixed with the former is the active agent, and, as Dr. Dupont shows, this is more conveniently, as it is more rationally, employed by inhalation, and the results are not less excellent.

Dr. Dupont has used about 150 litres in twenty-four hours. He finds that the gas is antiseptic, and hence is appropriate in the treatment of the septicæmia of tuberculosis; that it is anæsthetic, and hence quiets the cough, allays the irritability of the larynx, and favors sleep; that it lessens waste by checking oxidation, and thus lowers the temperature; and that it stimulates the digestive organs and increases the peristaltic movements of the stomach and intestines.

ALCOHOL IN ACUTE FEBRILE DISEASES.

In the course of his "Therapeutical Conferences," now publishing (*Bull. Gén. de Thérapeutique*, January 15, 1887), DUJARDIN-BEAUMETZ advocates the use of alcohol in accordance with the principles of the great English clinician, Dr. Todd. He observes that, although the first enthusiasm aroused by the theories and observations of Todd has somewhat subsided, there is a general recognition of the great advantages of the alcoholic medication. The indications for its use in fevers are the adynamic state, the extremes of life, and habitual use.

After careful study of the physiological action of alcohol, Dujardin-Beaumetz concludes that it acts in some respects as a tonic, as an aliment, and as an antipyretic—thus formulating an opinion by a combination of the various theories most entertained at the present time. It is an aliment because it undergoes in the organism a more or less complete combustion; it is an antipyretic because the oxidation of the alcohol takes place at the expense of the oxygen of the blood, and thus lessens the production of heat; and it is a tonic because it furnishes the nervous system the elements of force and power.

The principles and methods of Todd, so recently discussed and approved in France, are surely fallen into neglect—into positive oblivion, indeed, on this side of the ocean. They were warmly approved by a section of the medical profession twenty-five years ago, but now the actively stimulating treatment of febrile diseases is relegated to the domain of past errors.

HYPNONE.

In the *Archives de Neurologie* for January, 1887, *acetophenone* is the subject of a critical paper by MM. A. MAIRET et COMBEMALE, based on physiological and clinical researches. Under the name *hypnone*, by which it is now generally distinguished, and which was given it by Dujardin-Beaumetz and Bardet, who were the first to study its physiological actions (*Bull. Gén. de Thérap.*, Nov. 1885; also, *Ibid.*, January, 1887), it has been administered a good deal, but chiefly in France. Dujardin-Beaumetz and Bardet assigned the name *hypnone* because this word is significant of its most important property. Unfortunately, the new remedy, brought forward with no little *eclat*, has not confirmed the confident promises of its projectors. For the most part, it has proved to be inefficient, although not devoid of hypnotic action.

The researches of MM. Mairet et Combemale confirm the opinion of those who hold that *hypnone* is possessed of but feeble hypnotic property. They ascertained that the quantity required to produce sleep in animals is really toxic. Administered in toxic doses they say that it rapidly induces a comatose state which has nothing in common with natural sleep. It is, also, a cardiac and respiratory paralyzer, this effect coming on with the coma. Their clinical observations were made on twenty-two subjects of various mental disorders, the special conditions for which hypnone was prescribed being restlessness and insomnia. In only two cases was a hypnotic action obtained, and in these it was indirect; by allaying unrest and muscular agitation the disposition to sleep was favored.

The facts demonstrate, say they, that hypnone is not a hypnotic, and the physiological investigation gave negative results, as had been the experience of other investigators.

CLINICAL EXPERIMENTS WITH ANTIFEBRIN.

RIESE reports (*Centralblatt für die Therapie*, January, 1887) the results of the use by Professor Fürbringer of antifebrin. It was administered in 30 cases: 10 of acute rheumatism; 5 of typhoid; 2 of pleuritis; 4 of croupous pneumonia, and 9 of phthisis. At first the doses did not exceed 30 grains, but they were increased to 45, to 60, and in 1 case to 120 grains, without any toxic action of consequence. The date and degree of the decline in temperature were not uniform. As in the cases of acute rheumatism the temperature was only slightly elevated, the reduction effected by the remedy was inconsiderable. In typhoid, also, it influenced the fever but little, and in only one case was the diminution of fever maintained longer than the immediate action of the remedy. Very considerable variations were observed in the degree of antipyretic effect in different individuals, especially in the phthisical cases.

The slowing of the pulse corresponds to the decline of temperature. An increased tension of the arteries was usually witnessed. The respiration was also slowed, and lessened in volume, and occasionally some cyanosis of the face and extremities was observed. It never induced dizziness and headache, and, unlike antipyrin, did not cause nausea and vomiting; but, in some instances, improved the appetite. Perspiration was a constant attendant on the decline of temperature, and, when large doses had been administered, it was excessive. In three instances alarming chills accompanied the rise in temperature, and were followed by weakness.

As regards the results obtained from the use of antifebrin, it did not have a specific effect in any of the maladies, except in acute rheumatism. It neither shortened nor modified the violence of typhoid: the cases of pneumonia did no better than those under the expectant plan of treatment. The cases of rheumatism did well under it with one exception. After considerable doses the pain subsides in three days and disappears in five. It must be an exceptionally severe case if the pain has not disappeared by the fifth day. In four of the ten cases relapse occurred, but three of these required only one dose of forty-five grains. In all of these cases the remedy had been discontinued on the cessation of the pain, and the cure was effected with salicylate of sodium, but the patients experienced ringing in the ears, headache, and vertigo which they had escaped when taking antifebrin.

The author concludes that although antifebrin cannot fill the place occupied by salicylic acid in the treatment of acute rheumatism, it is quite possible in many cases to effect a cure with the former without the unpleasant effects produced by the latter remedy.

The effects of antifebrin have also been studied by LÉPINE (*Ibid.*), whose conclusions are as follows: In typhus the effects of antifebrin are similar to those of antipyrin. At the point of minimum temperature, antifebrin does not induce a collapse-like condition of depression, but rather increases the power of the pulse whilst it lessens the number of beats. In severe cases it may cause cyanosis, and lessen the urinary secretion.

Antifebrin is a nervine. The lancinating pains of the tabetic are always calmed as if by magic with one or two doses of eight grains each. It has also been used in neuralgia with success, and in a case of multiple sclerosis it lessened the trembling and improved the patient's strength.

INHALATION OF CARBOLIC ACID IN WHOOPING-COUGH.

PICK, in a late paper (*Deut. med. Wochenschrift*, No. 21, 1886), maintains that the inhalation of carbolic acid gives the best results in whooping-cough. The failures of this remedy which have been reported were due, for the most part, according to Fick, to too great dilution. By means of a special mask which he has made and figured in a paper published three years ago, he administers fifteen to twenty drops of the pure acid, on a roll of cotton, introduced into the mask. The inhalation is carried on for several hours every day, the cotton wad being renewed three times a day. No ill results have occurred, and the duration and violence of the disease notably lessened.

THE EFFECT OF FLUIDS ON FEBRILE HEAT.

PROF. GLAX has recently called attention (abstract in *Bull. Gén. de Thérap.*, Jan. 30, 1887) to the fact that drinking fluids increase the temperature of fevers. During fevers there is retention of liquids, and it is only when the temperature returns to the normal that they are evacuated in quantity. The rise of body-heat is in direct ratio to the accumulation of fluid in the organism, and Prof. Glax has ascertained that the temperature is notably reduced by withholding liquids. He explains this by supposing that the dilatation of the vessels, which is an incident of the febrile process, permits the accumulation of water in the blood, and thus there is a more prolonged contact of the red globules with the tissues, increasing oxidation or combustion.

Phosphate of Lime in the Treatment of the Sweating of Consumption.

Dr. Rebory, in his Thèse de Paris (*Revue de Thérapeutique*, February 1, 1887), maintains that phosphate of lime is the most efficient remedy we have to arrest the sweating of consumption. In many cases the beneficial effects are experienced on the day of its administration. It diminishes or arrests the sweats completely, often for a long time. The special advantages of the phosphate of lime are, that it is not a poison, is easy to administer, is well borne by the stomach, promotes nutrition, lessens the diarrhœa, and can be taken for a long time with decided benefit to the general health.

Vaseline for Hypodermatic Injections.

In a communication, which appears in the *Bul. Gén. de Thérap.* for Jan. 15, 1887, M. le Dr. Meunier, of Lyons, advocates the employment of vaseline as an antiseptic subcutaneous injection. After a course of experiments on animals, he ascertained that the method was perfectly adapted to the same mode of medication in man. Vaseline, he finds, diffuses readily through all the tissues, and the solutions made with it can be employed topically to the skin and mucous membrane, or be administered by the stomach. He insists that chemically pure vaseline be used in making the preparations. The following formulæ are proposed for hypodermatic use:

℞.—Eucalyptol (pure)	ʒss.
Vaseline (chem. pure)	ʒij.—M.

Fifteen grains to two drachms may be administered in twenty-four hours.

℞.—Eucalyptol (pure)	♏20
Iodoform	gr. j.
Vaseline (chem. pure)	℈iv

The dose of this is the same as the preceding.

℞.—Turpentine (pure, prepared according to the method of Berthellot)	℈j.
Vaseline (pure)	℈iv.

Of this, fifteen grains to two drachms may be given each day.

When tinctures of essential oils are to be administered, Dr. Meunier advises that, their purity being ascertained, they should be dissolved in pure vaseline, allowed to stand, and then filtered through two leaves of Swedish filtering paper. The author of these suggestions must refer to liquid vaseline.

Antipyrin in Hemicrania.

Dr. Ungar, in a paper which we find in the *Centralblatt für die gesammte Therapie*, January, 1887, proposes the use of antipyrin in hemicrania, this application of the remedy having been suggested by the similarity of its actions to those of salicylic acid. In some cases, administered when the first prodromes of the attack manifested themselves, it had sufficed to prevent them. In other cases, given during the maximum suffering, it distinctly alleviated the distress. Some were greatly benefited by it who had exhausted all the known remedies previously. In some instances, however, the relief afforded by it in one attack was not experienced in another; and in other cases it was without any value as a remedy. The dose varies from fifteen to twenty grains according to individual susceptibility.

NITROGLYCERINE IN HEART DISEASES.

DR. L. V. HOLST (*St. Petersb. med. Wochenschrift*, 30, 31, 1886; quoted by *Centralblatt f. Gesam. Therapie*, January 7, 1887) publishes some clinical experiences in the use of nitroglycerine in neuroses of the heart, valvular lesions, pulmonary œdema, etc. He finds that this remedy is a nervine, and one that powerfully affects the nervous apparatus of the heart. In cases of cardiac feebleness with little or no degenerative changes, the action of nitroglycerine was uniformly favorable. Cases of angina were greatly benefited, and sometimes cured. In all instances of cardiac failure, the organ being free from important degenerative changes, it should be administered instead of nerve and vascular stimulants, as camphor, musk, etc., which have hitherto been used. He mentions typhus and pneumonia, as maladies in which this practice is advisable. He does not regard nitroglycerine as a diuretic, although in many cases he has observed an astonishing flow of urine as a result of its action. This result, he thinks, is due to the vascular changes caused by it, for when the kidneys are alone diseased, it does not increase the flow of urine.

Dr. von Holst advises the use of the alcoholic solution—one per cent. The dose is not a fixed one, and must be varied according to the individual susceptibility, which is very different. Some patients are affected by three drops, others by six drops of the one per cent. solution, and hence it is necessary to begin with one drop and increase the dose until its effects are felt.

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INVESTIGATIONS CONCERNING ICTERUS.

F. MÜLLER contributes to the *Zeitsch. f. klin. Med.*, B. xii. H. 1 and 2, 45–114, the results of an elaborate research upon the disturbances occurring in the intestinal canal in icterus. His method consisted in administering nourishment whose quantity and composition had been accurately determined;